

④ a

For impulse response

$$y[n] = h[n]$$

$$4x[n] = \delta[n]$$

$$h[n] = 0.24 (\delta[n] + \delta[n-1] + \delta[n-2] + \delta[n-3])$$

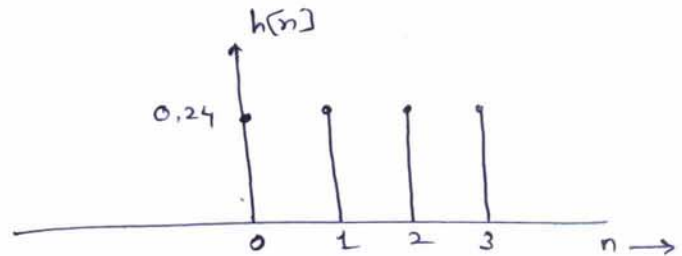
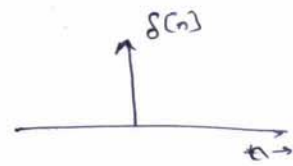
$$h[0] = 0.24 (\delta[0] + \delta[-1] + \delta[-2] + \delta[-3])$$

$$= 0.24 (1 + 0 + 0 + 0)$$

$$h[1] = 0.24 (0 + 1 + 0 + 0)$$

$$h[2] = 0.24$$

$$h[3] = 0.24$$



⑤

$$y[n] = x[n] + 0.5x[n-1] + x[n-2]$$

$$h[n] = \delta[n] + 0.5\delta[n-1] + \delta[n-2]$$

$$h[0] = \delta[0] + 0.5\delta[-1] + \delta[-2]$$

$$\therefore h[0] = 1$$

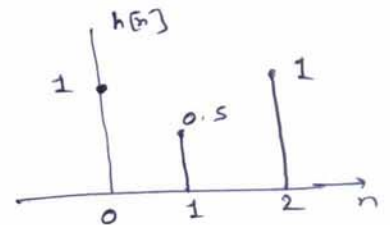
$$h[1] = \delta[1] + 0.5\delta[0] + \delta[-1]$$

$$= 0 + 0.5(1) + 0$$

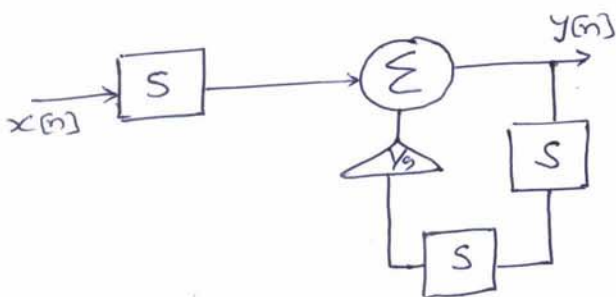
$$= 0.5$$

$$h[2] = \delta[2] + 0.5\delta[1] + \delta[0]$$

$$= 1$$



⑤ a) $y[n] = x[n-1] + \frac{1}{9}y[n-2]$



⑥ $y(t) = 3 \int x(t) dt - \iint y(t) dt$

